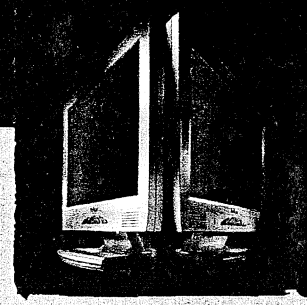
Belinea



SERVICE MANUAL
TFT-Display
Belinea 10 17 51
Model 11 17 09

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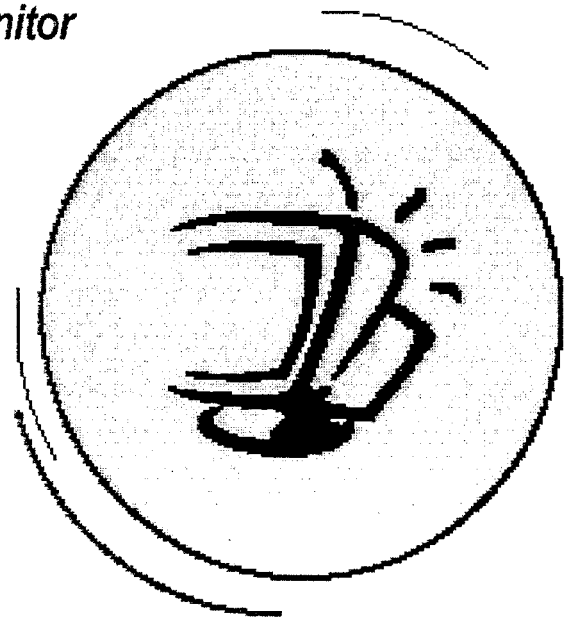
Belinea

Service Manual

***17** Inch (Viewable size 17.0″)*

TFT LCD Analogue Color Monitor

Belinea 101750 / 101751



Contents

1. Precautions

Safety Precautions 4
Servicing Precautions 6
Electrostatically Sensitive Devices (ESD) Precautions 7

2. Product Specifications

Specifications 8
Pin Assignment Table D-Sub 15 Pin Connector 9
Timing Chart 9
Dimensions 10

3. Disassembly and Reassembly

..... 11

4. Troubleshooting

..... 14

5. Exploded View & Parts List

..... 17

6. Packing & Unpacking

..... 19

7. Electrical Parts List

Main Board 20
Combo Board 22
OSD Control Board 24
Panel 25

CONTENTS

8. Block Diagram

..... 26

9. Wiring diagram

..... 27

10. PCB Layout

Main PCB 28
Key PCB 29
Combo board PCB 30
Semiconductor Aead Identification 32

11. Schematic Diagram

..... 34

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Belinea 101750/101751 Service Manual

First editior September 2003

1. Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1 Safety Precautions

1-1-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.

2. Disconnect the AC power ,Signal cable and Stereo cable before servicing.

1-1-2 Servicing the LCD Monitor

1. When servicing the LCD Monitor Disconnect the AC power cord from the AC outlet.

2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1-1-3 Fire and Shock Hazard

Before returning the monitor to the user,perform the following safety checks :

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.

2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.

3. To be sure that no shock hazard exists, check for leakage current in the following manner.
Warning : Do not use an isolation transformer during this test.

   a. Plug the AC line cord directly into a 120 Volt AC outlet.

   b. Unisg two clip leads, connect 1.5㏀ , 10 watt resistor paralleled by a 0.15㎌ capacitor in series with an exposed metal cabinet part and a known earth ground, such as an electrical conduit or electrical ground connected to an earth ground.

c. Use a SSVM or VOM with 1000 ohms per-volt or higher sensitivity to measure the AC voltage drop across the resistor (see Figure 1-1).

d. Connect the resistor to an exposed metal part having a return path to the chassis(metal cabinet, screw heads, knobs, shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.

e. Any reading of 5.25 Volt RMS (this corresponds to 3.5 milliampere AC) or more is excessive and indicates a potential shock hazard. Correct the shock hazard before returning the monitor to the user.

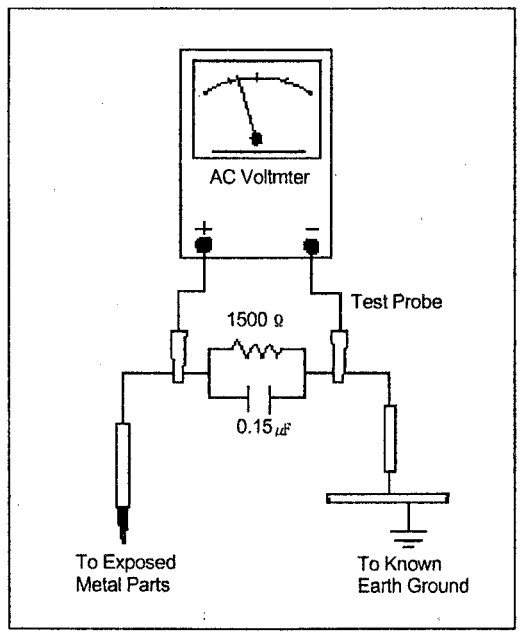


Figure 1-1.
Leakage Current Test Circut

1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacement that does not have the same safety characteristics as the recommended replacement part may create shock, fire and /or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2 Servicing Precautions

WARNING : An electrolytic capacitor installed with the wrong polarity might explode.

Caution : Before servicing instruments covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note : If unforeseen circumstances create conflict between the following servicing preautions and any of the safety precautions, always follow the safety precautions.

1-2-1. General Servicing Precautions

1. Servicing precautions are printed on the cabinet, and should be followed closely.

2. Always unplug the unit's AC power cord from the AC power source before attempting to :
   (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors,
   (c) connect a test component in paralled with an electrolytic capacitor.

3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.

4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.

5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples; metal panels, input terminals and earphone jacks)

6. Insulation Checking Procedure : Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter(500V) to the blades of the AC plug.
   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.

7. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3 Electrostatically Sensitive Devices(ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. such components are commonly called Electrostatically Sensitive Devices(ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.

2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.

3. Do not use freon-propelled chemicals. These can generate electrical charges Sufficient to damage ESDs.

4. Use only a ground-tip soldering iron to solder ESDs.

5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.

6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most relacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foid or other conductive materials.

7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution : Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your font from a carpeted floor can generate enough static electricity to damage an ESD.

2. Product Specifications

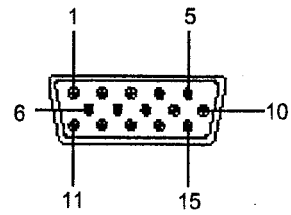
2-1 Specifications

LCD PANEL	Model	Belinea 101750/101751
	Type	Amorphous Active Matrix Super TFT LCD (LTM 170E6-L02)
	Screen Size	337.9(H) X 270.3(V) mm (17 inch diagonal)
	Maximum Resolution	1280 X 1024 @ 75Hz
	Pixel Range	0.264mm X 0.264mm
	Display Colors	8 bit data =16.7 million colours
	Contrast Rate	350 : 1
	Viewing Angle	70°/70°/60°/60°(up /down /left / right)
	Response Speed	25ms
	Brightness	250 cd/m2
Synchornization	Horizontal Frequency	60KHz(Max)
	Vertical Frequency	75HZ(Max)
Video Input	Video Signal	Analog RGB (0.714Vpp) 75 ohm
	Synchronous Signal Mode	LVDS (8bit) 3 sync signal, Clock
Power Consumption	Maximum	45W
	Soft Power off	Under 1W
Control Keys	Front part	Source,MENU/MUTE,AUTO/SELECT,Power, Brightness/-,Contrast/+,VOL/Mute
Input Power		100 / 240V(50~60Hz)
Wall Mount		VESA Standard
Safety & EMI	Safety Standard	UL,CE,CB,TUV
	EMI	FCC,RRL
	Low Radiation	MPR-II
Dimension	Size and Weight	380 X 176 X 368 / 5.8Kg

2-2 Pin Assignment

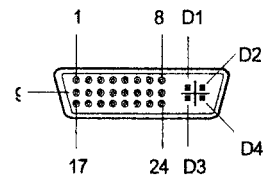
The 15-pin D-sub connector(male) of the Analog signal cable

Pin No.	Assignment	Pin No.	Assignment
1	Red Video	9	5V Input
2	Green Video	10	ST_DET
3	Blue Video	11	Ground
4	Frame Ground	12	SDA
5	N.C	13	H.Sync
6	Red Video Ground	14	V.Sync
7	Green Video Ground	15	SCL
8	Blue Video Ground		



The 24 pin DVI-D cable Pin Connection

Pin	Signal	Pin	Signal	Pin	Signal
1	T.M.D.S Data2-	9	T.M.D.S Data1-	17	T.M.D.S Data0-
2	T.M.D.S Data2+	10	T.M.D.S Data1+	18	T.M.D.S Data0+
3	T.M.D.S Data2/4 shield	11	T.M.D.S Data1/3 shield	19	T.M.D.S Data0/5 shield
4	T.M.D.S Data4-	12	T.M.D.S Data3-	20	T.M.D.S Data5-
5	T.M.D.S Data4+	13	T.M.D.S Data3+	21	T.M.D.S Data5+
6	DDC Clock	14	+5V Power	22	T.M.D.S Clock Shield
7	DDC data	15	Ground(for +5V)	23	T.M.D.S Clock+
8	Analog Vertical sync	16	Hot Plug Detect	24	T.M.D.S Clock-

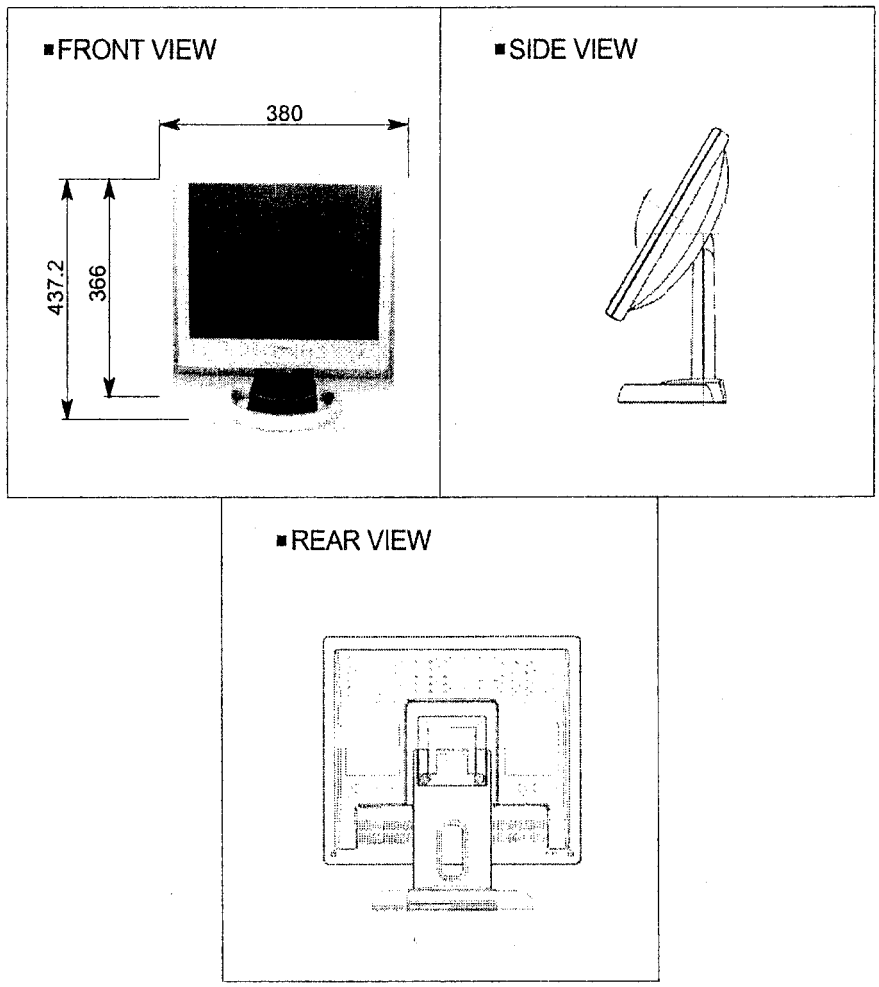


2-3 Timing chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

No.	Display Mode	Hor. Freq (kHz)	Ver. Freq (Hz)	Dot Clock (MHz)
1	VGA (720 X 400)	31.469	70.087	28.322
2	VGA (640 X 480)	31.469	59.940	25.175
3	VGA (640 X 480)	37.500	75.000	31.500
4	SVGA (800 X 600)	37.900	60.320	40.000
5	SVGA (800 X 600)	46.875	75.000	49.500
6	XGA (1024 X 768)	48.363	60.004	65.000
7	XGA (1024 X 768)	60.023	75.029	78.750
8	SXGA (1280 X 1024)	63.981	60.020	108.000
9	SXGA (1280 X 1024)	79.976	75.025	135.000
10	MAC (640 X 480)	35.000	66.667	30.240
11	MAC (832 X 624)	49.726	74.551	57.284
12	MAC (1152 X 870)	68.681	75.062	100.000

2-4 Dimensions



3. Disassembly and Reassembly

The section of the service manual describes the disassembly and reassembly procedure for the Belinea 101750/101751 Monitor.

※ WARNING : This has to be disassembled and reassembled carefully because TFT-LCD Panel is weak for impact. This monitor contains electrostatically sensitive devices. Use caution when handling these components.

3-1 Disassembly

Cautions : 1. Disconnected the monitor from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.

3-1-1 Separation between display part and stand part

1. Disconnected the Monitor from the power Cord before disassembly
2. Disconnected the monitor from Signal Source Cable.
3. Remove the 4 screws on the Stand.
4. Try it off the back Stand of the monitor.

3-1-2 The Display part Disassembly

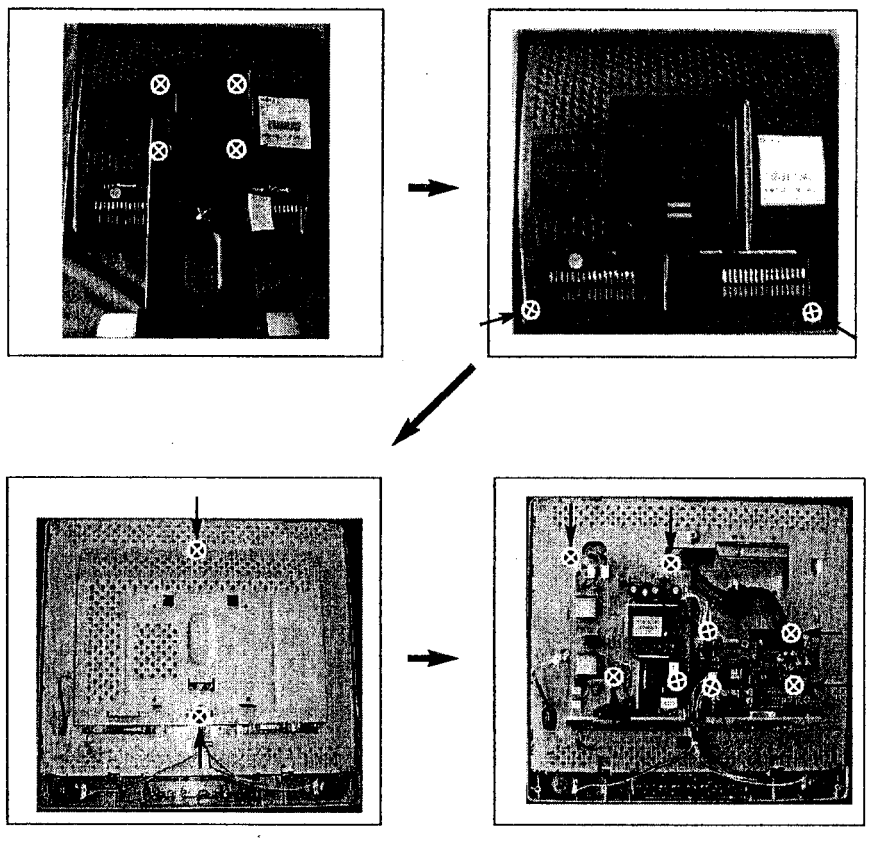
The Rear housing Removal

1.Unscrew the 2 point screws on the rear corner of the Rear Cover.
2. Disconnect Inverter wire.
3. Unscrew the 2 point screws on the Rear shield Cover and remove the Rear shield cover.
4. Disconnect Inverter wire and Combo cable from combo board.
5. Unscrew the 4point screws on the Combo PCB and the 1point screw of the FG wire.
6. Seperate the combo board.
7. Unscrew the 4point screws on the Main PCB and Remove the LVDS Cable.
8. Seperate the KEY cable and Speaker cable from Main PCB.
9. Seperate the Main PCB Assembly.
10. Seperate I/O Shield with Main board.
11. Seperate the Front Bezzel after unscrew the rear housing
12. Seperate the Rear housing after unscrew the 4point screws of the panel

3-1-3 Stand Disassembly

1. Remove 4 screws from the Stand Rear.
2. Remove Stand Head from the Stand assembly.
3. Remove 6 screws from the Stand Bottom.
4. Remove Stand Bottom from the Stand assembly.
5. Remove 2 screws from the Stand Bottom.
6. Remove Stand Base from the Stand assembly.

※ Fiqure



3-2 Reassembly

3-2-1 Display part Reassembly

Reassembly procedures are in the reverse order of Disassembly Procedures.
Confirm that insulation plate puts into on the left of the TFT-LCD
panel and main chassis.

3-2-2 Stand(Power Stand & Normal Stand) part Reassembly

Reassembly procedures are in the reverse order of Disassembly Procedures.

3-2-3 Display part and Stand part Reassembly

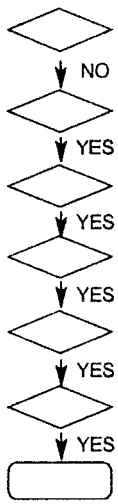
Reassembly reversely the Display part and Stand part disassembly method.

4. Troubleshooting

4-1 Micom(WT61P4L44)

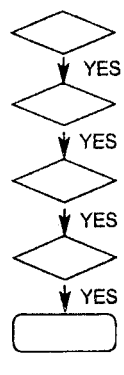
We can check the micom operation correctly by press the soft power switch.
When the chip does not operate in the normality, power indicating the LED is always extinguished.
In the normality, if the screen appear 'No Signal' or 'No Cable', the LED is green amber.
When the screen is displayed, the LED is green light.

4-2 When the LED operate in the abnormality

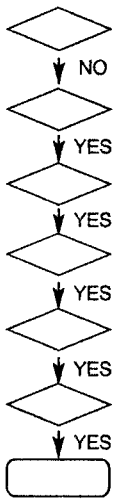
Diagram	Check point	Order	Check & Replace Item
		Press the soft power switch! The Screen is normal, only the key is abnormal.	Key PCB
	U2	Does appear DC 5V at pin 7 of U2	Combo B/D & D21,22,23
	U2	Does appear Clock pulse(12MHz) at pin 9,10 of U2	Y1
	U2	Does appear active low input at pin 25 of U2	U2
	U2	Does appear DC 5V at pin 5 of U2	U2
		Update the latest F/W of H950 and check the LED. Does it update in normality ,and operate the LED?	Replace Main PCB !
	It's fine !		

4-3 When H750D is not displayed in abnormality.

4-3-1 When screen is just white !

Diagram	Check point	Order	Check & Replace Item
	LVDS CABLE	Check connection of LVDS CABLE. Does appear white screen ?	LVDS CABLE
	U6 U7	Does appear DC 3.3V at pin 4 of U6 ? Does appear DC 2.5V at pin 4 of U7 ?	U6,U7 & Related circuit
	U4	Dose proper Clock pulse(14.3MHz) at 122,123pin of U4	U4
	J1	Dose appear active signal pin 10,11,22,23 of J1	U4
	Replace Panel !		

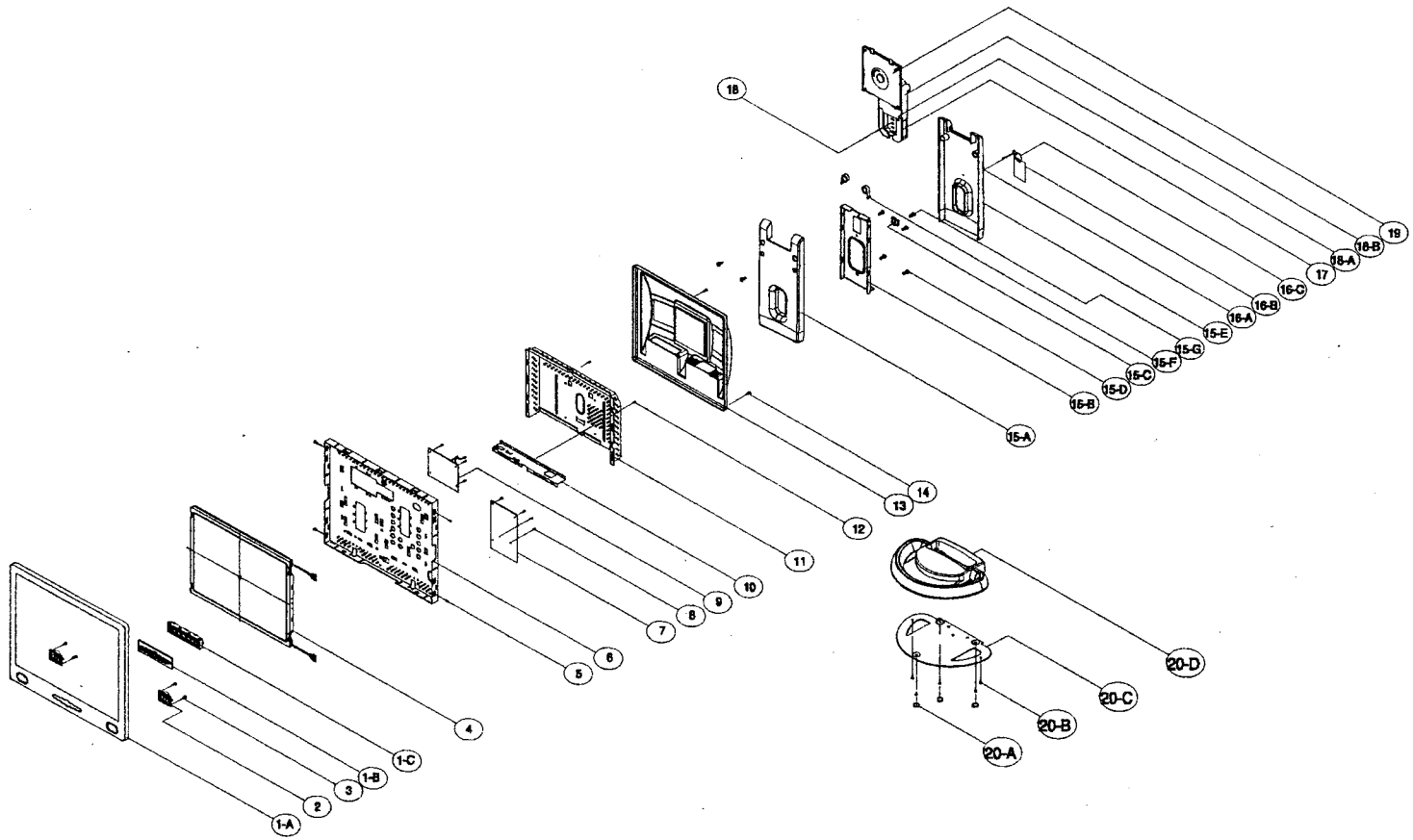
4-3-2 When screen is just black !

Diagram	Check point	Order	Check & Replace Item
	LVDS Cable	Check LVDS Cable is it ok?	LVDS Cable
	INVERTER Lamp Cable	Check inverter lamp cable Is it OK?	INVERTER Lamp cable
	J2	Does proper DC +5V appear at pin 2,3 of J2	COMBO & Wire
	U2	Dose proper DC 5V appear at pin14,15 of U2	U2
	U5	Dose proper DC 5V appear at pin2 of U5	U5
	LVDS Cable	Check the connection of LVDS Cable	LVDS Cable
	Replace Main PCB!		

4-3-3 The monitor has the following dimensions:

	with packaging	w/o packaging
Width in mm	444	380
Height in mm	197	176
Depth in mm	474	368
Weight in kg	7.2	5.8

5. Exploded View & Parts List



5-1.Belinea 101750 (Ivory)

NO.	PART NAME	CODE NO.	DESCRIPTION	Q'TY
1	BEZEL FRONT ASSY	6526470001AD	-	1
1-A	BEZEL FRONT	6226470004AD	H750,OEM,MAXDATA, ,ABS-HB, SD-0150,C81253	1
1-B	LENS,POWER	6226170020AD	H750/H550,OEM,PMMA	1
1-C	KNOB CONTROL	6226170030AD	H750,OEM,MAXDATA,SILVER(B2050), ABS-HB,SD-0150,C7425	1
2	SPEAKER	56410003AAAD	NB-04301-15,1 1/4X1 1/4INCH,8 OHM, 350HZ,1.0W	2
3	T/T,SCREW	67613004AAAD	BHB,+,3X8,...	4
4	17" TFT-LCD PANEL	5417L01294AD	17"TFTLCDPANEL...LTM170E6-L02,PVA,LVDS, 8BIT,16.2M,SXGA(1280*1024),4CCFL,75HZ	1
5	MACHINE,SCREW	68660001AAAD	BH,M3X6	4
6	MAIN,CHASSIS,ASSY	6526170004AD	H750,SECC,1.0T,AMLCD,HYDIS	1
7	ASSY, COMBO BD	3322330002VD	17,SMPS-12V/5V,48W, INVERTER-6.5MARMS,IPT/BENTEK	1
8	T/T,SCREW	67613007AAAD	BH,B-TYPE,+,M3X6	8
9	ASSY, PCB MAIN,DIP	0526171002AA	TFT,B17CF(H750_AMLCD),PCB MAIN,DIP	1
10	IO,SHIELD	6326170005AD	SPTE,0.5T	1
11	SHIELD,COVER	6326170003AD	SECC,1.0T	1
12	T/T,SCREW	67613007AAAD	BH,B-TYPE,+,M3X6	2
13	HOUSING,REAR	6226470001AD	H750,ABS-HB,SD-0150,C81253	1
14	T/T,SCREW	67613012AAAD	BHB,+,M4X 10,BLACK	2
15	STAND,NECK,ASSY	0922190001AD	-	1
15-A	STAND,FRONT	6222190002AD	H950VI,HB,SD0150,C81253	1
15-B	BODY,FRAME,LIFT	6322090001AD	H950,SECC,2.0T	1
15-C	STOPPER	6322090004AD	H950,SECC,2.0T	1
15-D	T/T,SCREW	67613012AAAD	BHB,+,M4X 10,BLACK	6
15-E	STAND,BACK	6222190003AD	H950VI,HB,SD0150,C81253	1
15-F	SPRNG,SLIDE	75210005AAAD	11X0.35T,Ø24	2
15-G	T/T,SCREW	67610003AAAD	BHC,M4X6	3
16-A	SPRING,PIN	758122090001	L40MM,Ø1.0	1
16-B	WARNING,LABEL	922199150022	REV.01,WARNING ART PAPER,42X82	1
16-C	CABLE,CLAMP	74170001AAAD	H950	1
17	SLIDE,GUIDE,L/R	6222090012/14AD	H950,ACETAL,BLACK,LEFT	1
18	SLIDE,FRAME	6322090003AD	H950,SECC,2.0T	1

NO.	PART NAME	CODE NO.	DESCRIPTION	Q'TY
18-A	SLIDE,COVER,FRONT	6222190004AD	H950VI,HB,SD0150,C81253	1
18-B	SLIDE,COVER,REAR	6222190005AD	H950VI,HB,SD0150,C81253	1
19	HINGE, ASSY(MOLD&PRESS)	6522090009AD	H950,PIVOT	1
	MACHINE,SCREW	68610004AAAD	BH,M4X 10,VESA,MOUNT,WHITE	4
	MACHINE,SCREW	68650005AAAD	BH,M4 X8, W/WASHER(Ø9)	2
	HINGE,COVER,FRONT	6222090018AD	H950,ABS-HB,SD-0150,C81253	1
	HINGE,COVER,REAR	6222090019AD	H950,ABS-HB,SD-0150,C81253	1
	T/T SCREW	67613004AAAD	BHB,+,3X8,...	3
20	STAND,BASE,ASSY	0922190002AD	-	1
20-A	RUBBER,FOOT	6222990001AD	NR,15.2Ø,1.3T,GRAY(423C)	3
20-B	T/T SCREW	67213001AAAD	FHB,+,3X8	5
20-C	BOTTOM,PLATE	6322090002AD	H950,SECC,2.0T	1
20-D	STAND,BASE	6222190001AD	H950VI,HB,SD0150,C81253	1

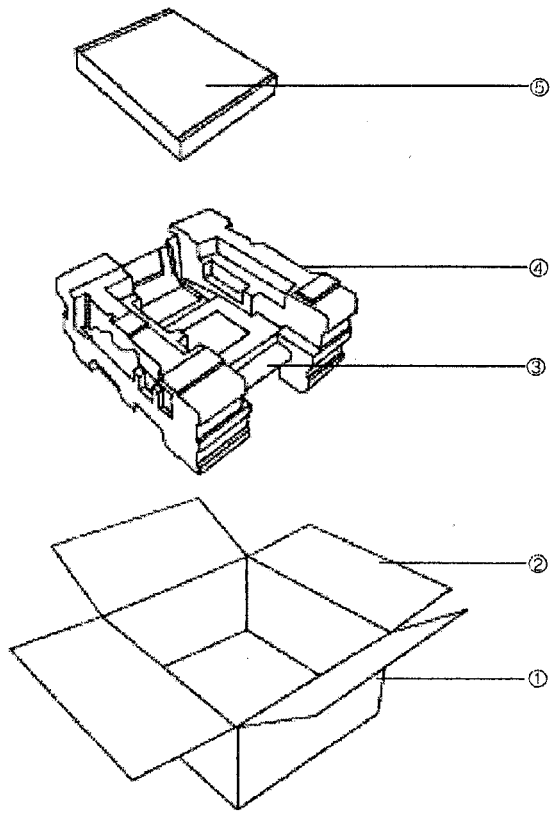
5-2.Belinea 101751 (Silver / Black)

NO.	PART NAME	CODE NO.	DESCRIPTION	Q'TY
1	BEZEL FRONT ASSY	6526470002AD	-	1
1-A	BEZEL FRONT	6226170014AD	H750,OEM,MAXDATA,SILVER(B2050), ABS-HB,SD-0150,C7425	1
1-B	LENS,POWER	6226170020AD	H750/H550,OEM,PMMA	1
1-C	KNOB CONTROL	6226170030AD	H750,OEM,MAXDATA,SILVER(B2050), ABS-HB,SD-0150,C7425	1
2	SPEAKER	56410003AAAD	NB-04301-15,1 ±X1 ±INCH,8 OHM, 350HZ,1.0W	2
3	T/T,SCREW	67613004AAAD	BHB,+,3×8,...	4
4	17"TFT-LCD PANEL	5417L01294AD	17"TFT LCD PANEL...LTM170E6-L02,PVA, LVDS,8BIT,16.2M,SXGA(1280*1024), 4CCFL,75HZ	1
5	MACHINE,SCREW	68660001AAAD	BH,M3×6	4
6	MAIN,CHASSIS,ASSY	6526170004AD	H750,SECC,1.0T,AMLCD,HYDIS	1
7	ASSY, COMBO BD	3322330002VD	17,SMPS-12V/5V,48W, INVERTER-6.5MARMS,IPT/BENTEK	1
8	T/T,SCREW	67613007AAAD	BH,B-TYPE,+,M3X6	8
9	ASSY, PCB MAIN,DIP	0526171002AA	TFT,B17CF(H750_AMLCD),PCB MAIN,DIP	1
10	IO,SHIELD	6326170005AD	SPTE,0.5T	1
11	SHIELD,COVER	6326170003AD	SECC,1.0T	1
12	T/T,SCREW	67613007AAAD	BH,B-TYPE,+,M3X6	2
13	HOUSING,REAR	6226470003AD	ABS-HB,SD-0150,K2007	1
14	T/T,SCREW	67613012AAAD	BHB,+,M4X 10,BLACK	2
15	STAND,NECK,ASSY	0922190003AD	H950VI,ABS-HB,SD-0150,K2007	1
15-A	STAND,FRONT	6222190007AD	H950VI,HB,SD0150,K2007	1
15-B	BODY,FRAME,LIFT	6322090001AD	H950,SECC,2.0T	1
15-C	STOPPER	6322090004AD	H950,SECC,2.0T	1
15-D	T/T,SCREW	67613012AAAD	BHB,+,M4X 10,BLACK	6
15-E	STAND,BACK	6222190008AD	H950VI,HB,SD0150,K2007	1
15-F	SPRING,SLIDE	75210005AAAD	11X0.35T,Ø24	2
15-G	T/T,SCREW	67610003AAAD	BHC,M4X6	3
16-A	SPRING,PIN	758122090001	L40MM,Ø1.0	1
16-B	WARNING,LABEL	922199150022	REV.01,WARNING ART PAPER,42X82	1
16-C	CABLE,CLAMP	74170001AAAD	H950	1
17	SLIDE,GUIDE,L/R	6222090012/14AD	H950,ACETAL,BLACK,LEFT	1

Exploded View & Parts List

NO.	PART NAME	CODE NO.	DESCRIPTION	Q'TY
18	SLIDE,FRAME	6322090003AD	H950,SECC,2.0T	1
18-A	SLIDE,COVER,FRONT	6222190009AD	H950VI,HB,SD0150,K2007	1
18-B	SLIDE,COVER,REAR	6222190010AD	H950VI,HB,SD0150,K2007	1
19	HINGE, ASSY(MOLD&PRESS)	6522090009AD	H950,PIVOT	1
	MACHINE,SCREW	68610004AAAD	BH,M4X 10,VESA,MOUNT,WHITE	4
	MACHINE,SCREW	68650005AAAD	BH,M4 ×8, W/WASHER(Ø9)	2
	HINGE,COVER,FRONT	6222090018AD	H950,ABS-HB,SD-0150,C81253	1
	HINGE,COVER,REAR	6222090019AD	H950,ABS-HB,SD-0150,C81253	1
	T/T SCREW	67613004AAAD	BHB,+,3×8,...	3
20	STAND,BASE,ASSY	0922190004AD	H950VI,ABS-HB,SD-0150,K2007	1
20-A	RUBBER,FOOT	6222990001AD	NR,15.2Ø,1.3T,GRAY(423C)	3
20-B	T/T SCREW	67213001AAAD	FHB,+,3×8	5
20-C	BOTTOM,PLATE	6322090002AD	H950,SECC,2.0T	1
20-D	STAND,BASE	6222190006AD	H950VI,HB,SD0150,K2007,SILVER(B2050)	1

6. Packing & Unpacking



No	Description	Specification	Quantity	Remarks
1	Tape-Masking	OPP W75 CLR	1.2 Mt	-
2	Carton Box	B17CF	1EA	CB DW-3
3	Set-Monitor	B17CF	1Set	EPS 60M C=0.018
4	Cushion-L/R	B17CF	1Set	17" TFT Monitor
5	Gift Box	B17CF	1EA	Cable Etc.

7. Electrical Parts List

7-1. Main Control Board

LOCATION No.	PART NO.	TYPE	DESCRIPTION
U5	12233863SRAF	IC,FET	Si3863DV,MOS FET,Vds=-30V,Rds(on)=75mOhm,Id=-3.6A
U7	15711117IAAF	IC,LINEAR	LM1117MPX-2.5,2.5V,800mA SOT-223, REGULATOR
U6	15311117IAAF	IC,LINEAR	Rev.01,LM1117MPX-3.3/AME1117CCGT, SOT-223, REGULATOR
U4	15719131EAAF	IC, IMAGE SCALER	MST9131
U3	16624C16DAAF	IC,MEMORY	AT24C16N-10SC-2.5/CAT24WC16J,16K,I2C,SOIC-8PIN
U1	16624C21DAAF	IC,MEMORY	AT24C21A-10SC-2.5,SOIC-8PIN
R1,R3,R5,R13	21700007ASTD	RES,CHIP,CT	0 OHM, 5%, 1/16W, 1608
R2,R4,R6,R10,R11,R12,R14,R17,R19, R20,R21,R22,R23,R24,R25,R50,R51, R52,R53,R54,R55,R56,R68,R69,R37, R36,R92,R95	21701017ASTD	RES,CHIP,CT	100 OHM, 5%, 1/16W, 1608
R61,R62	21702047AATD	RES,CHIP,CT	200 OHM,5%,1/16W,1608
R15	21702227ASTD	RES,CHIP,CT	2.2K OHM, 5%, 1/16W, 1608
R39,R35	21703307ASTD	RES,CHIP,CT	33 OHM, 5%, 1/16W, 1608
R73	21703917ZSTD	RES, CHIP, CT	390 OHM, 1%, 1/16W, 1608
R78	21703347AATD	RES,CHIP,CT	330K,5%,1/16W,1608
R41,R43,R59,R60,R66,R67,R74,R93,R94	21704727ASTD	RES,CHIP,CT	4.7K OHM, 5%, 1/16W, 1608
R75,R48,R49	21704737ASTD	RES,CHIP,CT	47K OHM, 5%, 1/16W, 1608
R7,R8,R9	21707507ATTD	RES, CHIP, CT	75Ω, 5%, 1/16W, 1608
C43	265001028APJ	CAP CERAMIC	1000pF, 50V, 10%, X7R, SMD, 1608
C82	265001038APJ	CAP,CERAMIC	0.01uF, 50V, 10%, X7R, SMD, 1608
C11	26508900209D	CAP,CERAMIC	20pF,50V,5%,CG,SMD,1608
C22,C23,C33,C34	26500220698J	CAP,CERAMIC	22pF, 50V, 5%, CG, SMD, 1608
C16	26508R0224MD	CAP, CERAMIC	0.22uF, 50V, +80%/-20%, Y5V, SMD, 1608
C12	26508902219D	CAP, CERAMIC	220pF, 50V, 5%, COG, SMD, 1608
C13,C17,C19,C21,C28,C30,C35,C36, C37,C38,C39,C40,C41,C44,C45,C46, C47,C48,C49,C50,C51,C52,C53,C54, C56,C59,C61,C63,C66,C68,C70,C73, C74,C75,C78	26508R0015MD	CAP, CERAMIC	0.1uF, 50V, +80%/-20%, Y5V, SMD, 1608
C1,C2,C3,C8,C9,C10	26508R0473MD	CAP, CERAMIC	0.047uF, 50V, +80%/-20%, Y5V, SMD, 1608
C76,C80	26508R0474MD	CAP, CERAMIC	0.47uF, 50V, +80%/-20%, Y5V, SMD, 1608
C57,C64,C71,C72	276601073CHD	CAP, CAN-ELECT, G.P	100uF, 16V, 20%, CASE:6.3X8, -40 ~ +85℃,SMD
C14,C15,C55,C60,C62,C67,C69	276602263CHD	CAP, CAN-ELECT,G.P	22uF, 16V, 20%, CASE:5X5, 5m, -40 ~ +85℃,SMD
C77,C78,C81,C83	276602273CTD	CAP,CAN-ELECT,GP	220uF,16V,20%,CASE:8*10,-40~+85℃,SMD
C18,C42,C58,C65	276604763CHD	CAP, CAN-ELECT,G.P	47uF, 16V, 20%, CASE:6.3X5, -40 ~ +85℃,SMD
Y1	312001200OMD	CRYSTAL	Rev.01, 12.000MHz,15PF,±30PPM,TS-1 TYPE,SMD
Y2	312001431BMD	CRYSTAL	Rev.01, 14.318MHz,33PF, ±30PPM,TS-1 TYPE,SMD
FB1,FB2,FB3,FB4,FB5,FB6,FB7,FB8, FB9,FB10,FB11	3222180004CD	EMI FILTER	BEAD,300 OHM,3A,SMD,2012
D3,D4,D5,D13,D14,D15,D16,D17, D18,D19,D20	352100039ATD	DIODE, SW	BAV99/MMBD1203, 200mA, 70V-100V, SOT-23, TAPING
D1,D2,D6,D7,D8,D9,D10,D11, D12,ZD1,ZD2	353100359ATD	DIODE, ZEN	BZX84C5V6,5.6V,SOT23

LOCATION No.	PART NO.	TYPE	DESCRIPTION
J1	4621150009ID	CONNECTOR, SMT WAFER	Rev.01, 12507WR-30A00, 30P MALE, 1.25mm, LVDS WAFER
R81,R82,R83,R84,R85,R86,R87,R88	21702207ASTD	RES,CHIP,CT	22 OHM, 5%, 1/16W, 1608
R44	21701027ASTD	RES,CHIP,CT	1K OHM, 5%, 1/16W, 1608
C20	276604753CTD	CAP,CAN-ELECT,G,P	4.7uF,16V,20%,CASE:4X5,-40 ~ +85℃,SMD
D21,D22,D23	3514AT5492TD	DIODE,SCHOTTKY	BAT54C, 30V, 200mA, 230W, SOT-23, TAPING, LOW DROP, DIODE
R71	21703317ASTD	RES,CHIP,CT	330 OHM, 5%, 1/16W, 1608
Q2	303900031ACB	TR, NPN	Rev.01, MMBT3904 LTI,3P,SOT-23
U2	4631050004FD 3922220016AD	CONNECTER,IC SOCKET PCB MAIN	DC-44PLCC-S,1.27mm PITCH, F/M,S/T,BROWN 112*90*1.6T,2LAYER,FR-4,4ARRAY,H750DVI/H950VI
R18,R34,R35,R47,R65,R76,R77, R79,R80,R45,R46,R70,R42,R89,R90	21701037ASTD	RES,CHIP,CT	10K OHM, 5%, 1/16W, 1608
	15717496AAAF	IC,LINEAR	TDA7496L,14V,25mA,2W+2W,8Ω, Audio Amp+DC Volume,16p,DIP
	144161P4GAHF	IC, μ- PROCESSOR	WT61P4-L44,5V,44PIN,PLCC,64K F-MEMORY, 1024byte SRAM,16 PWM
	4610110002WD	CONNECTOR	4PIN,2.0mm,MALE,RIGHT ANGLE,SMAW200-4
	4610110006KD	CONNECTOR	4PIN,2.0mm,MALE,RIGHT ANGLE,SMAW200-4,BLACK
	4611010013BD	CONNECTOR, D-SUB	DJ-15F4P,15P FEMALE RIGHT ANGLE, PBT UL94V-0,BLUE,HEXAGON NUT
	4641010005KD	CONNECTOR, STEREO JACK	DJ-36SP, 5P RIGHT ANGLE PCB LOCKING, PBT UL94V-0, BULK
	4625010002ID	CONNECTOR	DVI,1015-29P-FS1W,Ø1.93,Female

7-2. Combo Board

LOCATION NO.	TYPE	DESCRIPTION	Q'ty
B1,B2,B4	3S80	BEAD	3
CN1	BCP-03A-E18	INLET	1
CN2	SMAW 200-08	CONNECTOR	1
CN3,CN4,CN5,CN6	35002WR-02	CONNECTOR	4
CY10,11	DG472M Y1 250VAC	X-CAP	2
CY13	DG222M Y1 250VAC	Y-CAP	1
C10,11	220p 275V	Y-CAP	2
F1	T2AL 250V	FUSE	1
TH1	10D9	THERMISTER	1
IC30	KA431AZ	SHUNT REGULATOR	1
PC1	PC-17K1-CB	PHOTO COUPLER	1
BD1,BD2,BD3,BD4	2A07	DIODE	4
D48,D49	6.2V	ZENER-DI	2
D33	24V	ZENER-DI	1
D21	20V	ZENER-DI	1
D16	UF4004	ULTRA FAST DI	1
D30	10CTQ150	SCHOTTY DI	1
D34	SB560(FORMING)	SCHOTTY DI	1
D14	UF4007	ULTRA FAST DI	1
D15	1N4148	DIODE	1
IC1	ICE2AS01	CONTROL IC	1
U1	OZ960S	INVERTER IC	1
Q10	SPA04N60C3	FET	1
U13, U14	IRF7389	FET	2
LF1	20mH	LINE FILTER	1
T1	EFD 3030	TRANSFORMER	1
L51,L52	EFD 18/20	TRANSFORMER	2
L1,L2	10uH	PEAKING COIL	2
D40,41,42,43,44,45,46,47	KDS226	DIODE	8
Q31	C3198Y	TR	1
Q40	KRA104S	TR	1
Q41	KRC104S	TR	1
C14	472 1KV	C-CERAMIC	1
C33	221 1KV	C-CERAMIC	1
C17	103 50V	C-MILER	1
C36	104 63V	C-FILM	1
C12	68uF 400V (85℃)	C-ELEC	1
C15	47uF 50V (85℃)	C-ELEC	1
C16	0.68uF 50V (85℃)	C-ELEC	1
C31	470uF 25V (105℃)	C-ELEC	1
C32,C56	470uF 25V (85℃)	C-ELEC	2
C34	1000uF 10V (85℃)	C-ELEC	1
C35	470uF 10V (105℃)	C-ELEC	1
C41,C43,C44	105Z (16V)	MLCC	3

LOCATION NO.	TYPE	DESCRIPTION	Q'ty
C42	474Z (25V)	MLCC	1
C45,C47	103K (50V)	MLCC	2
C46	152K (50V)	MLCC	1
C49,C54	473K (50V)	MLCC	2
C50	221J (50V)	MLCC	1
C51	822K (50V)	MLCC	1
C52,C91	104Z (50V)	MLCC	2
C69,C59	225--3216	MLCC	2
C61,C65,C75,C76	15P	C-CERAMIC	4
C62,C66,C74,C77	333K (50V)	MLCC	4
C64	225--2012	MLCC	1
C60	106Z (16V) 3216	MLCC	1
R2	1M 1/4W	RESISTER	1
R12	150K 1/4W	RESISTER	1
R13	62K 1/4W	RESISTER	1
R14	100K 1W	RESISTER	1
R15,R17	6.2 1/8W	RESISTER	2
R16	200 1/8W	RESISTER	1
R18	2.2K 1/8W	RESISTER	1
R19	10 1/8W	RESISTER	1
R20	0.47/1W	RESISTER	1
R32	100 1/4W	RESISTER	1
R33	180 1/8W	RESISTER	1
R34	3.3K 1/8W	RESISTER	1
R35	6.8KF 1/8W	RESISTER	1
R37,R36	1.8KF 1/8W	RESISTER	2
R38	33KF 1/8W	RESISTER	1
R41	22(SMD)	RESISTER	1
R42	10K(SMD)	RESISTER	1
R45	30K(SMD)	RESISTER	1
R46	1M(SMD)	RESISTER	1
R47	27K(SMD)	RESISTER	1
R49	68K(SMD)	RESISTER	1
R50,R53	20K(SMD)	RESISTER	2
R52,R54,R56,R62	430(SMD)	RESISTER	4
R58,R59,R60,R61	0(SMD)	RESISTER	4
R63	12K(SMD)	RESISTER	1
R91	43K(SMD)	RESISTER	2
R64	16K(SMD)	RESISTER	1
J1,J2,J3,J4,J5,J35,J36,J37,J38,J39	0(SMD)	RESISTER	10
C72,C68,C63,C78,J32	5mm	JUMPER	5
J16,J17,J20,J28,J29,J40	7.5mm	JUMPER	6
J12,J19,J22,J24,J34	10mm	JUMPER	5

LOCATION NO.	TYPE	DESCRIPTION	Q'ty
B3,J6	12.5mm	JUMPER	2
J23,J25,J26,J30,J31	15mm	JUMPER	5
HEAT SINK 1	1 PIN	HEAT SINK	1
C42	474Z (25V)	MLCC	1
C45,C47	103K (50V)	MLCC	2
C46	152K (50V)	MLCC	1
HEAT SINK 2	1 PIN	HEAT SINK	1
SCREW	원근머리 3*6	SCREW	2
	SE9590 RTV	Silicon	2
PCB		PCB	1

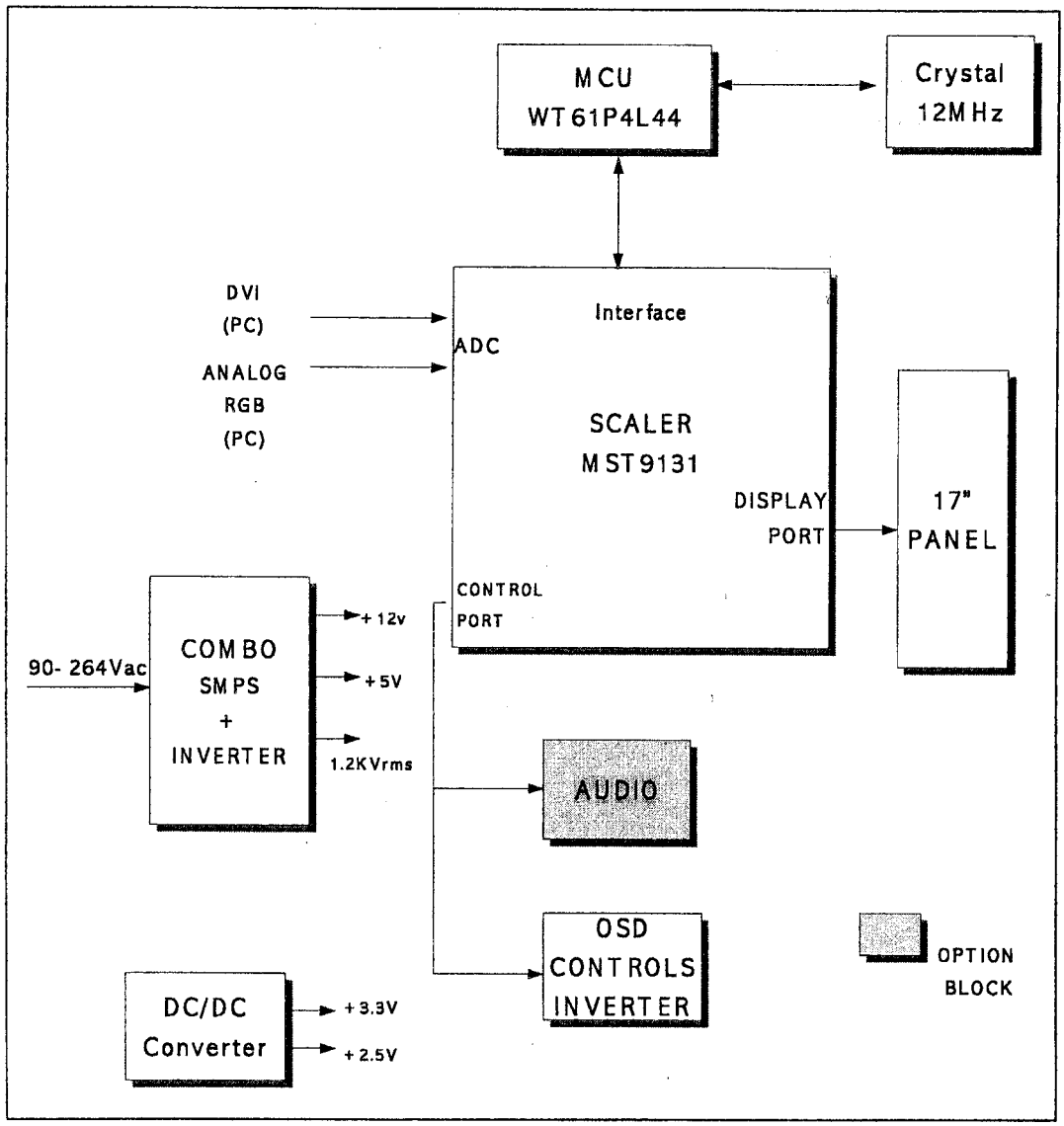
7-3. OSD Control Board

LOCATION No.	PART NO.	TYPE	DESCRIPTION
R701,R704	211010374ATD	RES,CARBON,AT	10K OHM, 5%, 1/6W
R700,R703	211033274ATD	RES,CARBON,AT	3.3K OHM, 5%, 1/6W
R702,R705	211033374ATD	RES,CARBON,AT	33K OHM, 5%, 1/6W
ZD700,ZD701,ZD702	35310015921D	DIODE, ZEN	Rev.01, MTZJ 5.6B/UZ-5 6BSB/1N5232B,5.6V, 5mA, 500mW,T-72,AT
	3922110009PD	PCB, KEY	110.4*24.6*1.6T, 1LAYER, FR-1, 6 ARRAY, H550/H750D
SW701,SW702,SW703,SW704, SW705,SW706,SW707	5821000GRAAD	SWITCH,TACT	DHT-1105TABF,2P,RESET S/W,DC12V, 50mA,5mm,TAPING,H5.30
LED	3541000311TD	DIODE, LED	Rev.01, SM3411/HB3b-243, 85mW, 30mA, GREEN, TAPING
	4922120071KD	HARNESS, KEY CABLE ASS'Y	4X5P(SMH200-04,BOI,240mm,UL1061#26,CORE2,H750V

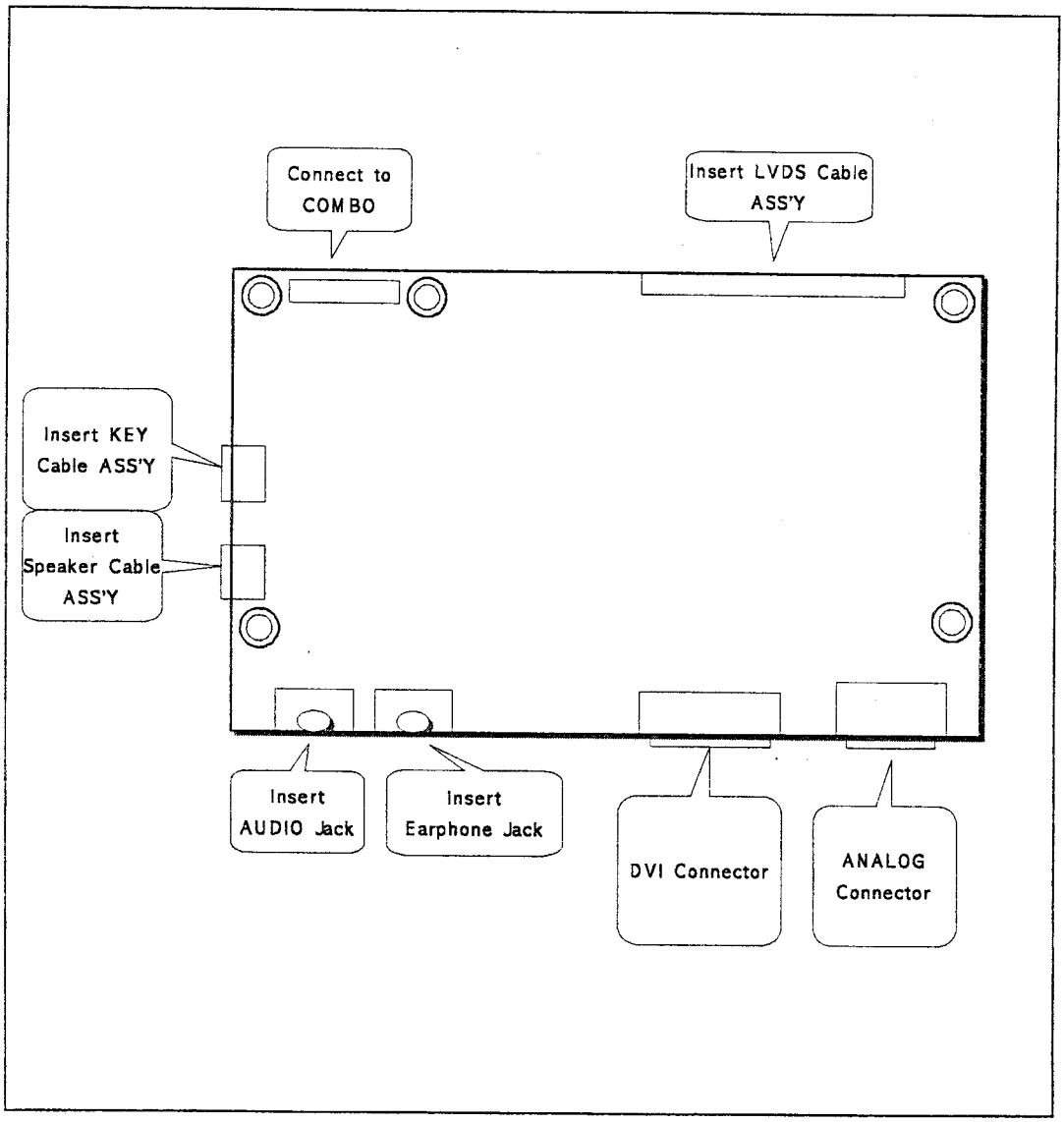
7-4. Panel

PART NO.	TYPE	DESCRIPTION	Q'ty
5417L01294AD	17" TFT-LCD Panel	LTM170E6-L02,PVA,LVDS,8Bit,16.2M,SXGA(1280*1024),4CCFL,75Hz	1

8. Block Diagram



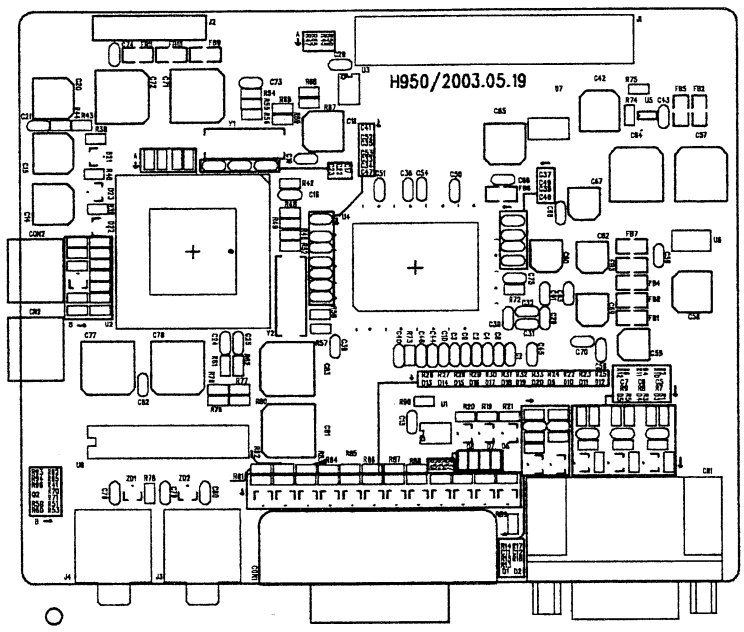
9. Wiring diagram



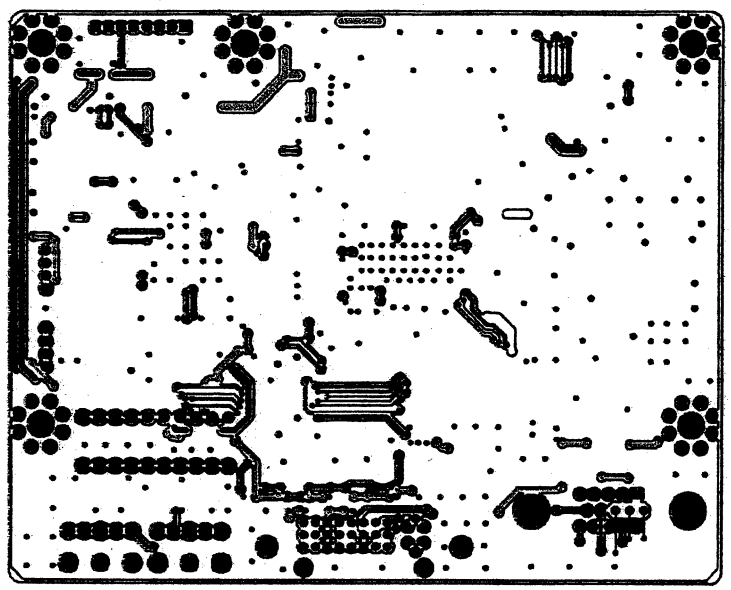
10. PCB Layout

10-1. Main PCB

10-1-1 TOP View

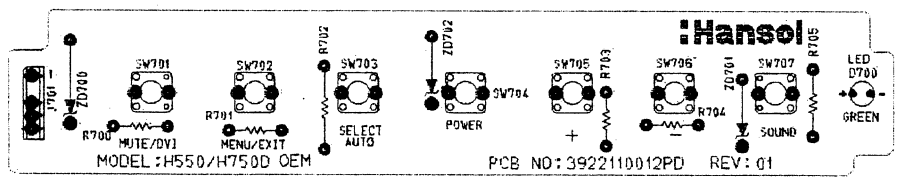


10-1-2 BOTTOM View

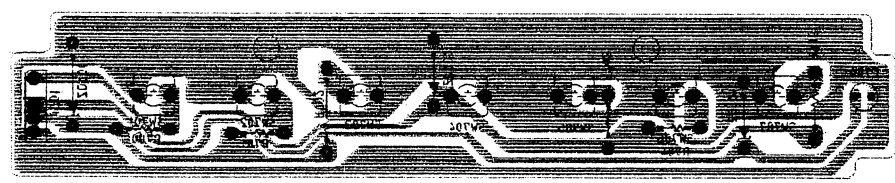


10-2. Key Control Board

10-2-1 TOP View

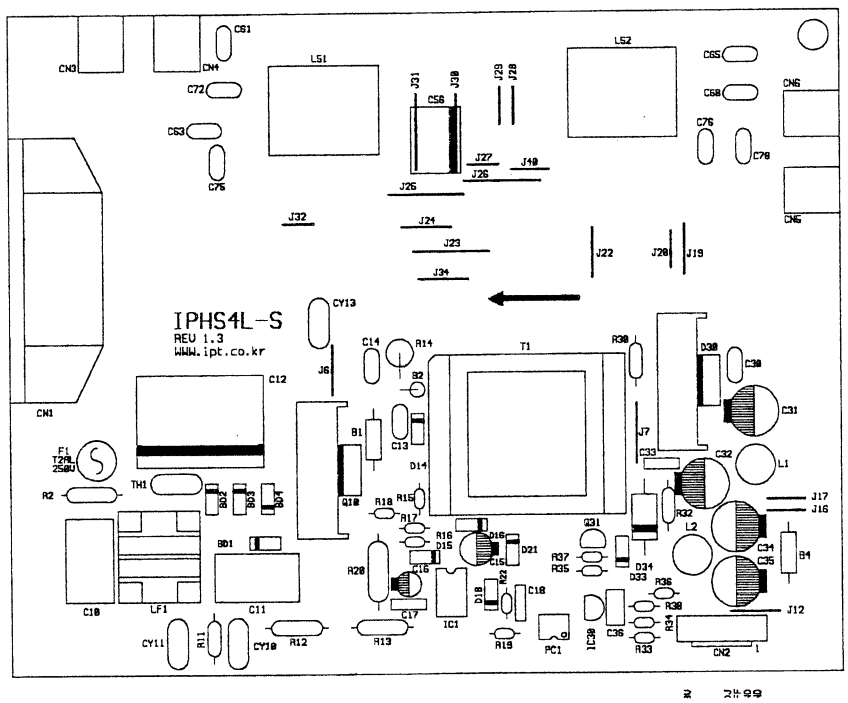


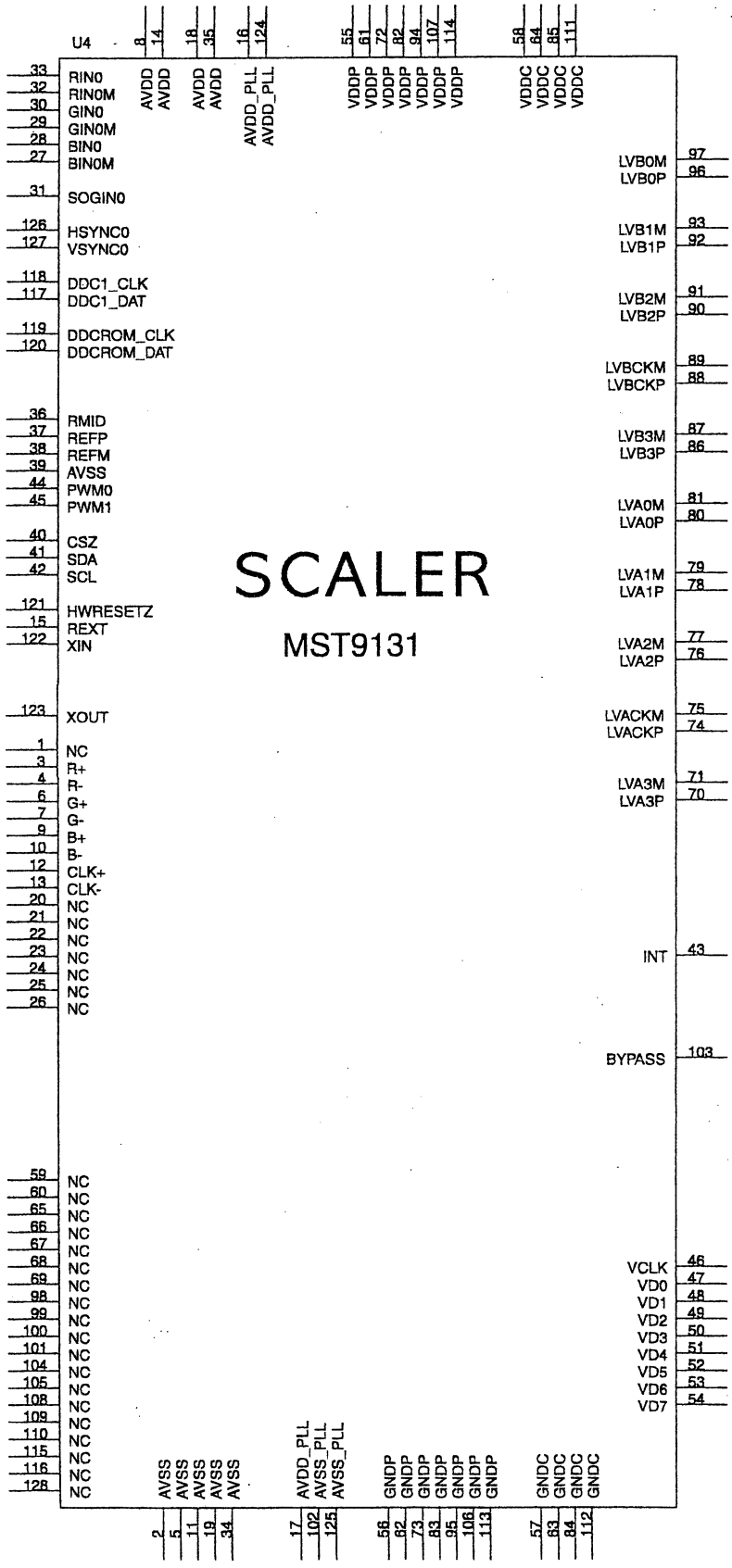
10-2-2 Bottom View

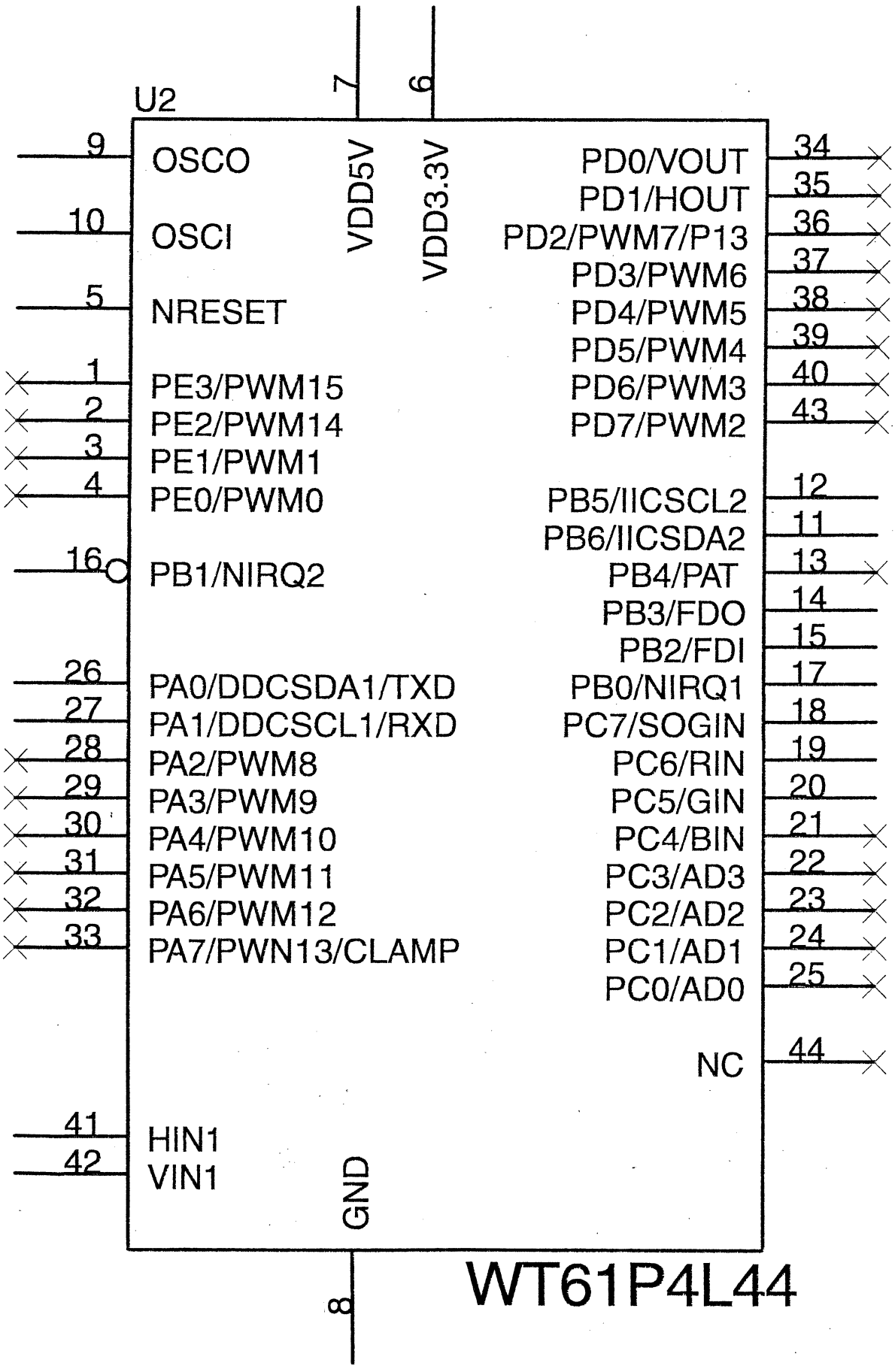


10-3. COMBO board PCB

10-3-1 TOP View




U4
SCALER
MST9131
33 RIN0
32 RIN0M
30 GIN0
29 GIN0M
28 BIN0
27 BIN0M
31 SOGIN0
126 HSYNC0
127 VSYNC0
118 DDC1_CLK
117 DDC1_DAT
119 DDCROM_CLK
120 DDCROM_DAT
36 RMID
37 REFP
38 REFM
39 AVSS
44 PWM0
45 PWM1
40 CSZ
41 SDA
42 SCL
121 HWRESETZ
15 REXT
122 XIN
123 XOUT
1 NC
3 R+
4 R-
6 G+
7 G-
9 B+
10 B-
12 CLK+
13 CLK-
20 NC
21 NC
22 NC
23 NC
24 NC
25 NC
26 NC
59 NC
60 NC
65 NC
66 NC
67 NC
68 NC
69 NC
98 NC
99 NC
100 NC
101 NC
104 NC
105 NC
108 NC
109 NC
110 NC
115 NC
116 NC
128 NC
8 14 AVDD
18 35 AVDD
16 124 AVDD_PLL
55 61 72 82 94 107 114 VDDP
58 64 85 111 VDDC
97 LVB0M
96 LVB0P
93 LVB1M
92 LVB1P
91 LVB2M
90 LVB2P
89 LVBCKM
88 LVBCKP
87 LVB3M
86 LVB3P
81 LVA0M
80 LVA0P
79 LVA1M
78 LVA1P
77 LVA2M
76 LVA2P
75 LVACKM
74 LVACKP
71 LVA3M
70 LVA3P
43 INT
103 BYPASS
46 VCLK
47 VD0
48 VD1
49 VD2
50 VD3
51 VD4
52 VD5
53 VD6
54 VD7
2 5 11 19 34 AVSS
17 102 125 AVDD_PLL AVSS_PLL AVSS_PLL
56 62 73 83 95 106 113 GNDP
57 63 84 112 GNDC


U2
7
6
9
OSCO
10
OSCI
5
NRESET
1
PE3/PWM15
2
PE2/PWM14
3
PE1/PWM1
4
PE0/PWM0
16
PB1/NIRQ2
26
PA0/DDCSDA1/TXD
27
PA1/DDCSCL1/RXD
28
PA2/PWM8
29
PA3/PWM9
30
PA4/PWM10
31
PA5/PWM11
32
PA6/PWM12
33
PA7/PWN13/CLAMP
41
HIN1
42
VIN1
VDD5V
VDD3.3V
GND
8
34
PD0/VOUT
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PD1/HOUT
36
PD2/PWM7/P13
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PD3/PWM6
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PD4/PWM5
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PD5/PWM4
40
PD6/PWM3
43
PD7/PWM2
12
PB5/IICSCL2
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PB6/IICSDA2
13
PB4/PAT
14
PB3/FDO
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PB0/NIRQ1
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PC7/SOGIN
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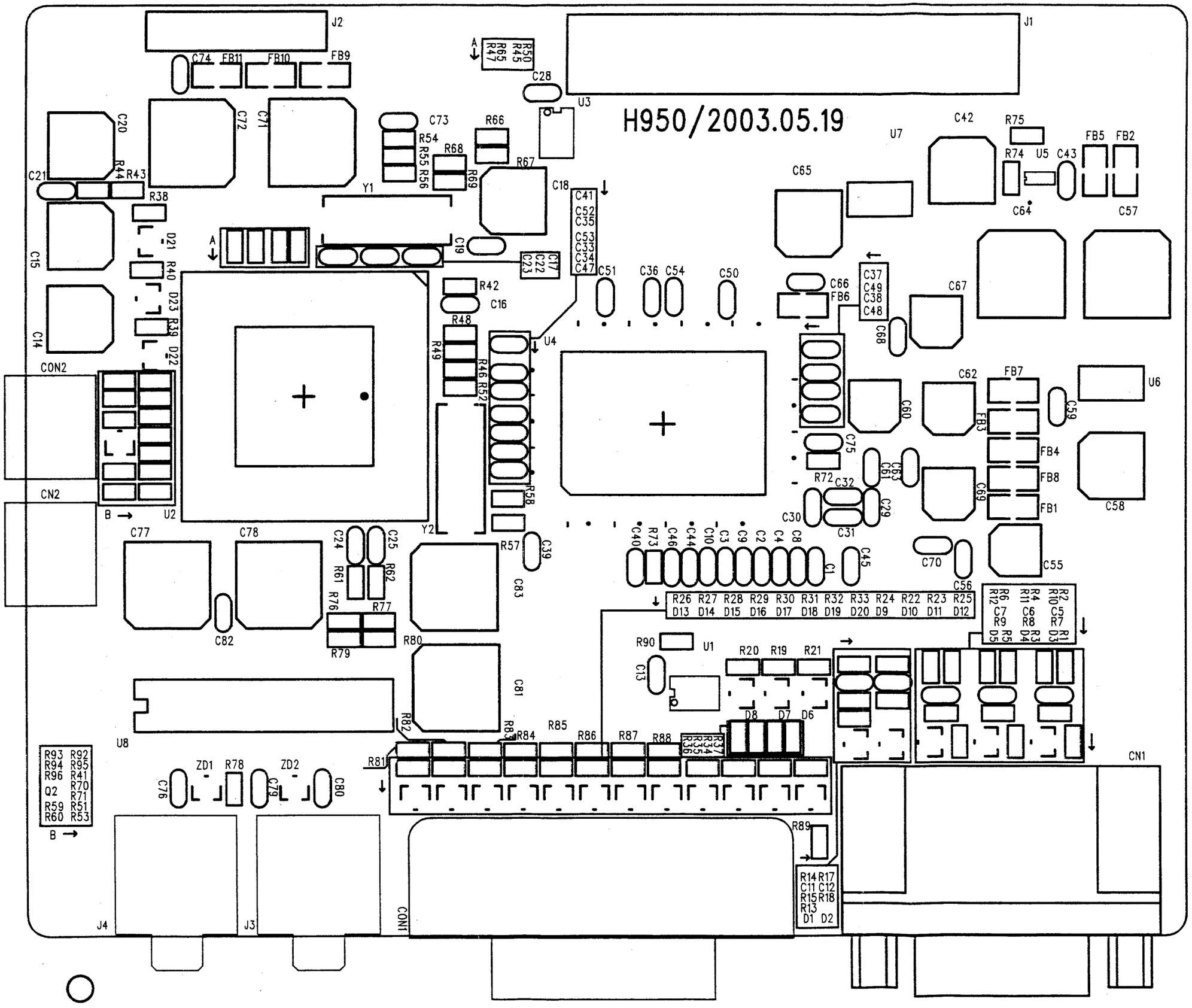
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Y2
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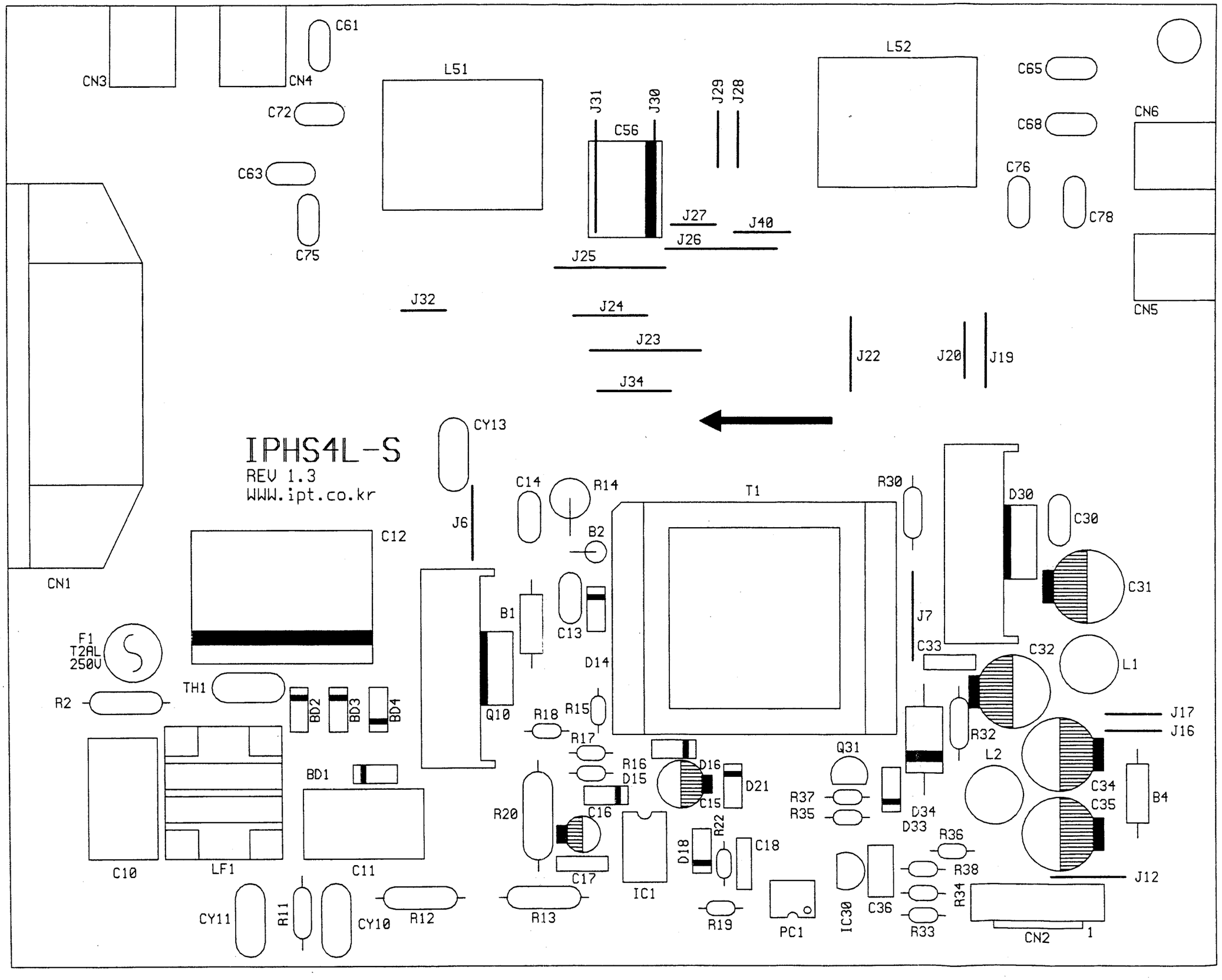
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